



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/976,964	10/11/2001	Edwin James Harris IV	112690-098	2962

29176 7590 09/04/2003
BELL, BOYD & LLOYD LLC
P. O. BOX 1135
CHICAGO, IL 60690-1135

EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT	PAPER NUMBER
----------	--------------

1751

DATE MAILED: 09/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/976,964

Applicant(s)

HARRIS, EDWIN JAMES

Examiner

Kallambella Vijayakumar

Art Unit

1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Election dated 06/09/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 10-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Detailed Action

Claims 1-32 are pending with the application. Priority date is the filing date of the application.

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A (1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the examiner on form PTO-892 has cited the references and/or the applicant has provided IDS on PTO-1449, they have not been considered.

Applicant's election with traverse of Group-I, Claims 1-9 in Paper No. 5 is acknowledged. The traversal is on the ground(s) that Claims in Group-II (Claims 10 and 11) depend on Claim-1 of Group-I, and those claims are necessarily allowable if claim-1 is deemed allowable. This is not found persuasive because Claims 10 and 11 deal with the configuration of a multi-layer PCB making use of the VVM substrate film of claim-1, and for the reasons given in Paper-3 dated 05/06/2003. The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simendinger et al (WO 97/21230) further in view of Neuhalten (WO 96/41356) or Shrier et al (WO 96/02924).

Simendinger et al (-230) disclose the compositions and method for making resistive elements comprising a first electrically non-linear composition (VVM) and a second VVM composition, wherein the VVM compositions contain a uniform dispersion of filler particles in a polymer. The fillers included conductive particles with a resistivity of less than 10^{-1} ohm-cm such as metallic as aluminum, nickel, silver; the semi-conductors with a resistivity of at most 10^2 ohm-cm, and optional fillers that are electrically non-conductive. Simendinger et al further disclose that the polymeric component for VVM could be selected from many varieties of

curable polymers such as thermosetting epoxies and elastomers. Simendinger et al also disclose that the green VVM compositions could be cured directly in contact with the electrodes, particularly with mesh or other formable electrodes. The melt blending or the solvent blending of polymer and particles and the formation of VVM material by conventional methods would meet the limitation of impregnation of conductive particles in a curable insulative binder while in a non-solid state in claim-1. (Abstract, Page-4, Line-13 to Page-8, Line-20; Page-9, Lines: 1-8; Page-10, Lines: 23-27).

Simendinger et al (-230) do not disclose a self-supporting type VVM material substrate. Formation of the VVM in the form of green film or sheets would be obvious by calendaring or by compression molding used by Simendinger, and this would meet the limitation of self-supporting and curable substrate in claim-1 (Page-9, Lines: 1-8).

Neuhalfen (-356) teaches the advantages and orientations thin film over-voltage protection device (VVM) that could be surface mounted on a substrate such as FR-4 epoxy or polyimide and the advantages of this configuration (Abstract, Page-5, Line: 30-31).

Shrier et al (-922) disclose a VVM comprising of a reinforcing layer of insulating material consisting a low compressibility fabric of insulating materials such as polymer tape, polymer fibers and glass, that is impregnated with a variable voltage material, followed by reinforcing between rollers, wherein a self supporting VVM substrate film would be inherent (Abstract, Page-8, Line-1 to Page-9, Line-23, Page-16, Lines: 27-31, Fig-1)

It would have been obvious for a person of ordinary skill to modify the VVM composition and/or methods of making VVM of Simendinger et al (-230) to make free standing VVM films/sheets whose benefits in surface mounting of the VVM substrate have been shown

by Neuhalfen (-356) in the analogous field of VVM Materials, and further modify the VVM substrate by reinforcing with insulating fabric/mesh to benefit by such a reinforcement per the disclosure of Shrier et al in the analogous art of VVM Materials, and to arrive at the limitations of the instant claims by the applicants with reasonable expectation of success.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shrier et al (WO 96/02924) in view of Rector et al (WO 00/51152).

Shrier et al (-924) disclose a multi-layer variable voltage protection device containing a dispersion of conductive, semi-conductive and/or insulating particles and colloidal insulating particles in a suitable binder. The binders chosen by Shrier were polymers known in the art such as elastomers, epoxy resin and polyimide. Shrier et al further disclose that the VVM could be provided in the form of a mat made of polymer, glass or ceramic fibers (Abstract, Page-5, Line-27 to Page-6, Line-5; Page-8, Lines: 08-31; Page-12, Lines: 13-18, Page-16, Lines: 10-16). Shrier further disclose that the final mixtures could be applied to form VVM components or VVM layers could be deposited as layers from dispersion followed by cured in-situ (Page-18, Lines: 14-18). The preparation of polymer-particle blend prior to curing by a melt process or a solvent process is well known in the art as shown Shrier et al (-922), and a coating of VVM material to a mesh or mat forming a coated mesh or a self supporting green film/sheet would inherently meet the limitation of a self-supporting VVM substrate.

Shrier et al did not disclose the free self-supporting VVM substrate discretely.

Rector et al (-152) discloses a thin film over-voltage circuit protection device that could be used in a surface mount configuration that could further be configured with various

configurations of the electrodes (Abstract). Rector also disclose the voltage variable polymeric material to contain a uniform dispersion of conductive particles in a polymeric material (Page-7, Lines: 9-17) the Rector et al further disclose the use of solid sheets of FR-4 epoxy and the polyimide substrates in the fabrication of PC Boards (page-8, Lines: 6-7).

It would have been obvious for a person of ordinary skill to form a free standing VVM film or sheet by making modifications to the composition and methods of Shrier et al by choice of design, optionally selecting either calendaring or compression molding that are well known in the art (Shrier-922) and to produce a VVM substrate as a self-supporting film or sheet to take advantage of benefits from such a configuration per the disclosure of Rector, because both the disclosures are in the related art of VVM Materials, and obviously arrive at the limitations of the instant claims by the applicants.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 703-305-4931. The examiner can normally be reached on M-Th, 07:00 - 15.30 hrs, Fri: 05.30-14.00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 703-308-4708. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-3599 for After Final communications.

Art Unit: 1751

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

kmv
August 13, 2003


YOGENDRA N. GUPTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700